NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

SUPPLY MANAGEMENT ANALYSIS OF THE CHILEAN NAVY ACQUISITION SYSTEM

December 2014

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REPORT DOCUMENTATION PAGE		Form Approved OMB No. 0704–0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE December 2014	3. REPORT TYPE AND DATES COVERED MBA Professional Report

4. TITLE AND SUBTITLE SUPPLY MANAGEMENT ANALYSIS OF THE CHILEAN NAVY ACQUISITION SYSTEM	5. FUNDING NUMBERS
6. AUTHOR(S) Felipe Garbarini Ibanez	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number ____N/A____.

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited	12b. DISTRIBUTION CODE A

13. ABSTRACT (maximum 200 words)

The purpose of this study is to analyze the Chilean Navy acquisition system using the Supply Management Theory elements as a framework. The research describes the Chilean Navy acquisition system based on its current organization, its regulations, and procedures, and the Supply Management foundations act as a theoretical structure to analyze Chilean Navy acquisition systems, whose results are expressed in eight recommendations to improve the Chilean Navy acquisition system.

The Supply Management Theory provides a competitive advantage that is applicable to the defense environment in reducing costs, improving combat systems, and increasing efficiencies that accelerate the satisfaction of troop's requirements. The foundational principles used in the analysis include strategic formulation, performance measurement, supply base optimization and management, and an adequate organizational structure.

The Chilean Navy acquisition organization possesses a center-led type organization and follows the Chilean procurement laws, regulations, and procedures to acquire material and contracting services that emphasize the principles of transparency and equality of offers. Those regulations determine that all acquisitions shall be performed under a full and open competition procedure.

The analysis results were structured under eight recommendations to improve Chilean Navy acquisition systems and establish the difficulty for the Chilean Navy to establish long-term relationships with suppliers, given regulations that emphasize the principles of transparency and equality of offers.

14. SUBJECT TERMS "supply chain," "supply chain management," "supply management," "Chilean navy," "Chile," "acquisition," "procurement," "acquisition system."	15. NUMBER OF PAGES 69
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UU

NSN 7540–01-280-5500

Standard Form 298 (Rev. 2–89)
Prescribed by ANSI Std. 239–18

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SUPPLY MANAGEMENT ANALYSIS OF THE CHILEAN NAVY ACQUISITION SYSTEM

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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

NAVAL POSTGRADUATE SCHOOL
December 2014

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ACKNOWLEDGMENTS

The author would like to express his gratitude to the Chilean Navy, which permitted him to live this wonderful learning experience and obtain useful knowledge to carry out his further professional duties. He would also like to thank to all his Marias for their constant support, encouragement, grammar and spelling suggestions, legal support, and especially for never asking: When will you be finished?

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I. INTRODUCTION

A. PURPOSE

The purpose of this study is to analyze the Chilean Navy acquisition system using the Supply Management Theory foundation elements as a framework. The research will describe the Chilean Navy acquisition system's status with its regulations and procedures, while the Supply Management foundation elements will act as a theoretical structure to evaluate and recommend improvements to the Chilean Navy acquisition system.

The Chilean Navy acquisition system provides the elements and services to accomplish its goals and perform its operations, and through implementation of the Supply Management concept, impacts the organization, and satisfies the operation requirements. In fulfilling its mission, the Chilean Navy is required to maintain their systems at the highest possible level of operational suitability and readiness; therefore, the procurement of supplies for the maintenance of ships and aircraft, fuel, ammunition, and others requirements must be maintained in a timely manner to support the Chilean Navy capabilities.

Supply management today is considered a powerful tool to obtain a competitive advantage in the business world and within Armed Forces. That competitive advantage will be reflected in lower costs, better supplies, increased efficiencies, and higher satisfaction of troop requirements. Supply management constitutes a useful instrument to obtain cost reductions and improve efficiency in the procurement process. The efficiency of the Chilean Navy acquisition system could be enhanced with the implementation of the applicable Supply Management concepts to increase the system's readiness. In its procurement process, the Chilean Navy follows the national regulations established in law and other directives; however, in compliance of those regulations, the procedures adopted by the Chilean Navy do not implement many of the modern concepts of supply management. Thereby, the Chilean Navy misses the benefits that Supply Management brings.

The objectives of this project are to understand the benefits obtained by means of the application of the Supply Management concept into business, and how the Chilean Navy acquisition system could benefit by enforcing them. In addition, we will recommend that the Chilean Navy acquisition system implement some improvement that would reinforce the principles of supply chain management.

B. METHODOLOGY

Within this study, Supply Management foundational concepts and their benefit to business will be researched to obtain an understanding of expectations within the military environment, government, and non-profit organizations. For the author, it is an opportunity to integrate knowledge assimilated through coursework.

This study requires the collection of Chilean Official Government Policies, Regulations, and procedures that regulate the Chilean Navy acquisition system. Those documents are available and will be obtained by open sources through official Internet sites.

This project will investigate and analyze the Chilean Navy acquisition system based on the theoretical foundation established by Robert Monczka, Robert Handfield, Larry Giunipero, and James Patterson in their book, *Purchasing and Supply Chain Management* (2009). In their book, the authors recognize the value of supply management to obtain competitive advantage, and how the procurement process has shifted from a clerical routine activity to a strategic one. In addition, it introduces benefits through resource savings, increased efficiencies, and value generation. They also provide a detailed description of benefits obtained in the application of these foundations.

The primary research question is:

1. How can we implement the theoretical foundations of supply management into the Chilean Navy acquisition system?

The subsidiaries research questions are:

1. What are the theoretical foundations of supply management and the benefits of its implementation?

2. What are the Chilean Navy acquisition regulations?

3. How does the Chilean Navy configure its acquisition system?

4. What foundation of supply management theory could be applied to the Chilean Navy acquisition system?

5. What recommendation could be made in order to implement those foundations?

C. LIMITATIONS

This project covers only the acquisition of unclassified goods and services, since the acquisition of weapons system in Chile are framed under classified regulations.

D. SUMMARY

To provide recommendations to the Chilean Navy acquisition system, this project sets the theoretical foundations of Supply Management to be used as a referential outline in the analysis of the Chilean Navy acquisition system. It will also describe the procurement regulations and organizations to that will interface with the Supply Management foundation elements. The results of the analysis are formulated recommendations to enrich the Chilean Navy acquisition system. One of the constraints of the project is that it must adhere to the procurement of services and unclassified material.

Chapter I introduces the research questions for this study, its methodology, limitations and purpose. In Chapter II states the importance of supply management as a source of competitive advantage and in its founding principles that constitutes the framework for further analysis. Chapter III describes the Chilean Navy acquisition system to understand its structure and regulations and to recognize how the foundational principles of supply management can be applied. Forth Chapter analyzes the Chilean Navy acquisition system contrasting its current structure, regulations, and procedures with the founding principles of supply management to formulate recommendations to improve the Chilean Navy procurement system. Finally, Chapter V explains the conclusions and areas of further research to supplement this project.

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II. SUPPLY MANAGEMENT

Today, supply management is considered one of the more powerful tools to obtain a competitive advantage inside an industry. This chapter will describe why companies seek competitive advantage in the business environment to provide more benefits to stakeholders, and why military institutions should pursue that advantage as well. By understanding competitive advantage and how supply management contributes to building it, it is possible to construct a model with the foundations of supply management theory for use in the Chilean Navy acquisition system analysis.

A. COMPETITIVE ADVANTAGE

Competitive advantage results from the way in which companies allocate and use its resources to face the industry environment. Investors are willing to provide capital to a business that will offer them a certain level of profit or positive return on investment, based on the risk they might incur. According to the Opportunity Cost Theory, investors do not obtain a desired profit margin; instead, they will move their investment to the next best alternative. Stakeholders can obtain a superior return investment by establishing a strategy that takes offensive or defensive action to create a position inside their industry. Michael Porter's competitive advantage model suggests that those strategies include cost leadership, differentiation, and focus. Companies using the differentiation strategy pretend to produce unique products appreciated by buyers inside a particular industry. A company can establish its differentiation by means of product characteristics, distribution, marketing, and image. Businesses applying a focused strategy emphasize that products meet the expectations of a particular segment or group. Finally, cost leadership means that a company performs its activities at the lowest cost in the industry. Competitive advantage is a consequence of management's strategies and allocation of resources. Organizations that obtain a competitive advantage: "operate at [the] lowest cost, command a premium price or both," (Magretta, 2012, p. 64) are reflected in a major return on investment in comparison with the industry.

One perspective for the sourcing of competitive advantage is the way firms organize and perform discrete activities so that companies create value performing these activities, which result in valuable products or services to customers (Porter, 1990, p. 40). The activities that companies perform to produce their merchandise or services are the basis of competitive advantage; how they perform these activities is the foundation for the differences among competitors. Joan Magretta defines these activities as,

> Discrete economic functions or processes, such as managing supply chain, operating a sales force, developing products, or delivering them to customers. An activity is usually a mix of people, technology, fixed assets, sometimes working capital, and various types of information. (2012, p. 73)

Each of these activities has an associated cost or resource requirement that adds value to the final product. In Porter's framework, the sequence of activities shapes the value chain, and forces managers to focus on those activities that result in higher price (differentiation) or lower costs to final products.

According to Michael Porter, support and primary activity constitute the value chain. Primary functions are those activities involved in current production, and support activities represent overall infrastructure to aid the others. Purchasing is one support activity and a "major supply chain activity" (Monczka, Handfield, Giunipero, & Patterson, 2009, p. 17), since a close coordination with the supplier permits aligns the supply chain with company's strategic objectives.

Companies are not isolated organizations that are engaged in economic activities; they are related to material suppliers and services, distribution channels, and customers, and therefore, these relationships affect the cost and effectiveness of their business. It is necessary to understand the value chain as the integration of these built-in chains, and the further management of these relations represents an important source of competitive advantage: "competitive advantage is increasingly a function of how well a company can manage this entire system" (Porter, 1990, p. 42). The adequate administration of the entire supply chain, from suppliers to end users, will bring a real competitive advantage inside the market. Today, supply chains compete with each other instead of companies.

1. Competitive Advantage Inside the Military

Government organizations can obtain the benefits raised by Porter in the Theory of Competitive Advantage and value chain in the execution of their activities, because they define how to deliver value to the people. Additionally, the main strategic objectives in this environment are to determine the relevance of competitive advantage in the commercial environment to satisfy customer and stakeholder profits. A company who shows competitive advantage will have a higher return over investment to stakeholders.

States are different than companies because they are focused on common goods as their main purpose. Within an organizational structure, states provide services to people that are perceived as common good. It is appropriate to note that in carrying out their activities, state agencies should approach the competitive advantage concepts established by Porter. Each of these organizations also perform duties that individually generate value to the people; but rather than convert into lower costs or differentiation, this advantage translates into better service quality or increased services delivered within the same budget. A nonprofit organization that shows competitive advantage will provide high-quality service to stakeholders.

Armed forces need some capabilities to development their activities and to perform the necessary missions for national security. As part of the state, the Chilean Armed Forces contributes to common good through established guidelines in the constitution that, “exist for the defense of the homeland, and are essential for the national security” (Chile, 1980, p. Article 53). To accomplish that mission, the Chilean Armed Forces require capabilities to be materialized through personnel, training, support, facilities, equipment, and organizations. The nature of the national defense mission requires armed forces ready to act when situation requires to executing a designated combat mission under time constriction. Richard Betts defines the capability of the national defense as a proper combination of,

> Force structure (jargon for number and types of units); modernization (the replacement of obsolescent equipment with more advanced models); sustainability (the capacity to continue performing mission for long periods of combat); and readiness (immediate ability to execute a designated combat mission). (1995, p. 37)

Just as in the commercial world, the armed forces require efficiency to implement those capabilities when obtaining quality, incurred cost, and the speed that is required by the combatant. These are all relevant factors in the capability development, and therefore for national security. One of the strategic goals for the armed forces is to obtain and maintain the national defense capabilities to accomplish combat missions required by the government. Taxpayers acting as stakeholders expect the government to provide its armed forces with the capabilities required by the national defense.

From another perspective, Chilean procurement regulations set: "the bidding rules must establish the conditions enabling to achieve most advantageous combination between all the benefits of the good or service to acquiring and all its associated costs, present and future" (Chile M. d., 2003). Implicit in this statement, it is the requirement of efficiency to be addressed in the process of obtaining supplies by maximizing the benefit provided by the good at lowest possible cost. As will be detailed further, one of the benefits provided by the application of supply management principles is to increase the efficiency of the supply process, both through cost reduction and through the incremental benefit provided by the best quality goods and timely delivery.

The armed forces should look for the competitive advantage that delivers the proper administration of the supply chain in the process of obtaining their capabilities. They materialize their capabilities through procuring material and services from different suppliers. The procurement activities executed in this process shape a supply chain that is administrated by bringing a competitive advantage to military organizations. In the next section will be described how supply management is a source of competitive advantage.

B. SUPPLY MANAGEMENT AS A SOURCE OF COMPETITIVE ADVANTAGE

Supply management is an activity located beyond the acquisition process and has to be placed at the strategic level to plan for obtaining supplies and working jointly with providers to achieve the business' objectives. Supply management is defined as,

> A strategic approach to planning for and acquiring the organization's current and future needs, through effectively managing the supply base, and utilizing a process orientation in conjunction with cross-functional

> teams (CFTs) to achieve the organizational mission. (Monczka et al., 2009)

For its part, supply management reinforces the idea that supply chain management is about relationship management (Lambert, 2008), and the proper administration of the relationships between the components of the supply chain will produce efficiencies and savings that will benefit all of them.

The supply management requires the coordination and administration of all the activities in the chain to satisfy the final customer, including: the synchronization of activities and their planning; the proper information sharing that includes demand forecast, inventory levels, and product design: and the collaboration of members to plan, operate, and coordinate. Another definition for supply chain management (SCM) is, "the design and management of flows of products, information, and funds throughout the supply chain" (Sanders, 2012, p. 3). Therefore, this definition implies that the supply management is located at the strategic level of companies, and responds to the nature of design and management. In addition, it provides the concept of coordination required between all the components of the chain, which translates into close relationships between each of the components.

Supply management is a source of competitive advantage that has adopted a strategy of cost leadership or differentiation. An efficient and coordinated supply chain network improves productivity and efficiency, which translates into a decrease in unit costs that subsequently become incremental earnings before taxes. Supply management contributes to improved product differentiation within the market by allowing the timely flow of information that facilitates the adaptation of products to customer expectations. The main benefits to be gained from proper implementation of supply management are (Sanders, 2012, pp. 39–40):

- Reduce inventory, distribution, and coordination cost.
- Provide service excellence.
- Reduce lead time.
- Reduce product development cost and time.

Different factors in the business environment and changes in consumer behavior have led the implementation of supply management concepts, of which the most relevant is the intensive use of interconnected information systems. The elements that have facilitated the adoption of supply management include the information available, the level of competition, change in consumer behavior, and the reaction capability of companies to face the environmental changes. Today, more information is available, and thanks to the development of information technology, it is possible to obtain and analyze information related to supply chain components at relatively low-cost. The most important facilitator in this field is the intensive use of the Internet and the focus on data analysis capability. Customers are demanding better quality products and services, which increases the need for supply and variety. The Internet has played a role in this transcendent aspect because it makes it easier for buyers to search and select products. Customers assume a new active role inside the business environment, contributing to an economy-driven environment demanding, "customized products with high quality delivered at record speed" (Sanders, 2012, p. 17).

Easy access to systems that facilitate the information interchange and the confluence of government regulations to facilitate international trade, have impacted the level of competition. New products are delivered to market faster, at a cheaper cost, and with broad selection available to satisfy personalization of requirements. Finally, with improvements in information exchange, companies are able to detect early and react faster to changes in the environment, because they know what is occurring in real time, and they can make necessary adjustments to align the supply chain to a customer's expectation.

C. SUPPLY MANAGEMENT COMPONENTS AND ACTIVITIES

A supply chain is a group of organizations connected to move resources between producers to customers in different types of configurations. These components will play the role of customers and providers depending on their position inside the chain. The supply chain is a "network of entities involved in producing and delivering a finished product to the final customers" (Sanders, 2012, p. 3). For the proper exchange of product,

information, and funds, the entities that make up the supply chain perform different activities, which need to be coordinated, planned, and controlled to obtain efficiencies. Figure 1 shows a diagram of a generic supply chain.

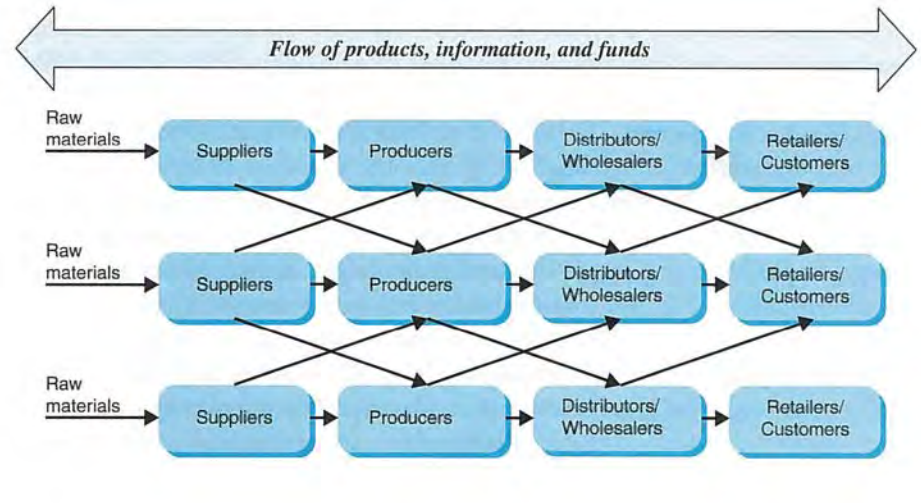

Figure 1. Generic supply chain diagram (from Sanders, 2012)

Supply chain management is the overall administration of supply chain components to coordinate the movement of resources inside that chain. Supply management or supply chain management will be used interchangeably in this study, and shall be understood as a strategic function that is more developed and located beyond the clerical purchasing function at the strategic level. This definition also incorporates the modern concept of sourcing, the function responsible for all activities needed to purchase items from suppliers (Sanders, 2012). Supply chain management involves the following activities (Monczka et al., 2009, pp. 17–19).

- Purchasing or procurement
- Inbound transportation
- Quality control
- Demand and supply planning
- Receiving, materials handling, and storage

- Material or inventory control
- Order purchasing
- Production planning, scheduling, and control
- Warehousing and distribution
- Shipping
- Outbound transportation
- Customer service

The role of supply management is coordinating the execution of supply chain activities to obtain a competitive advantage. This implies a favorable exchange of information and coordination between the members of the chain (Sanders, 2012, pp. 6–7). SCM shall coordinate the flow of products, information, and funds inside and outside the chain in such a way that the workflow of these is timely and efficiently developed. SCM manages the relevant information sharing like sales forecasts, inventory levels, and product information that are vital for tuning the supply chain to avoid the squandering or shortage of resources. Finally, collaborative planning, operation, and decision making will share the costs and benefits.

Organizations set their goals and the path to achieving those goals in the strategic plan, which should be shared with the entire supply chain to support it and also to align its activities, shared information, and exchanged resources. To be achieved, strategy should consider the environmental characteristics, the components' competencies, and the competitive advantage. Once the plan is expanded to the supply chain, the strategic plan must align with the supply chain objectives to procure those capabilities both within the public interest and within national regulations. The organization is strategically aligned when all its components perform coordinated activities to reach a common unique goal: the satisfaction of the customers and stakeholders, and for the military organizations obtaining and maintaining their capabilities.

D. SUPPLY MANAGEMENT THEORY AND THE BENEFITS OBTAINED IN THE APPLICATION OF ITS FOUNDATIONS

Since the beginning of this century, different authors have theorized about integrated supply chain management, focusing on the importance of supplier relationships and the foundations that obtain a competitive advantage in supplier management. The principal foundations will be discussed here using as a main reference the work of Robert Monczka, Robert Handfield, Larry Giunipero, and James Patterson, *Purchasing and Supply Chain Management* (2009).

1. Supply Chain Strategy

The business strategy is the plan that defines the long-range objectives and how to achieve these goals to maintain a competitive position inside the industry. The development of the business strategy has to consider the environmental characteristics, company strength and competencies, and the interaction among different actors in the industry. The business strategy is the guiding document for the development of functional strategies in each area or function inside the company, to ensure the alignment and support of the business strategy. “Supply chain strategy is a long-range plan for the design and ongoing management of all supply chain decisions that support the business strategy” (Sanders, 2012, p. 35).

Development of supply chain strategy must contribute to the generation of value for shareholders through the satisfaction of the needs of the market and the integration of the supply chain components. The model used by John Grattorna (1998) to formulate the supply chain strategy consists of four principal areas: customer service strategy, demand flow strategy, sourcing strategy, and supply chain integration strategy.

a. Customer Service Strategy

Customer service strategy states how the company reacts to customer expectations to increase the stakeholder profit in accordance with business strategy. It identifies the segment of the customer base, the cost to provide services to that specific segment, and the level of response of the customer to the service/product (market share).

b. Demand Flow Strategy

Demand flow strategy defines the linkage between customers and the product under the guidance of business strategy. It establishes the channel design or the method used to provide services/goods to customers, determines the levels of production and inventory to satisfy customers, and fixes the configuration of the supply chain in terms of numbers and location of providers, the distribution network, and limitations to operational cost to chain components.

c. Sourcing or Supply Management Strategy

Sourcing management strategy determines the production method and location to accomplish the business strategy. These factors have a significant impact on company cost structure and its associated risk. It includes making decisions, management of supply chain capacities, and planning and controlling elements.

d. Supply Chain Integration Strategy

Supply chain integration strategy defines the level of integration among supply chain components in the decision-making process, and the degree of sharing of common resources within the chain. It includes the degree of integration in different activities, the integration type, and the means used to materialize the integration.

Before developing a supply chain strategy, it is necessary to obtain an overview of what elements and services a company has obtained from suppliers, the relevance of those items in the production process, and its demand trends. Spend analysis is defined as: “the process of collecting historical data by commodity, relative to demand from the lines of business, with the exception of personnel expenses, occupancy, and corporate spend” (Monczka et al., 2009, p. 46). The results determine what and where the business spends its money, if goods purchased and contracted services were received, who the suppliers are and how purchase volume is distributed, how the distribution of purchases within the business is configured, and if there are opportunities to standardize products and concentrate acquisitions.

The exploration of data obtained in spend analysis defines the supply bases and implementation procedures to optimize supply processes according to the category of the goods. In accordance with Robert Monczka et al., the data obtained in the analysis is displayed by category of expense or commodity, their total expense, and the number of suppliers by commodity (2009, p. 200). Subsequent analysis provides opportunities to optimize the supply base, and reduce costs by purchasing concentration or product standardization.

Another process that supports the supply chain strategy is the portfolio analysis that delivers different strategies of acquisition for the different categories of purchase. Portfolio analysis is the classification of the family of purchases in the following four categories, based on the value of the supplier for business and the risk impact in its operations (Monczka et al., 2009, pp. 215–218).

1. Critical commodities are those for which companies spend a highest annual amount of resources, and are critical to profitability and operations. Critical commodities have complex and rigid specifications, and it exists few qualified providers and.

2. Routine commodities are readily available and have low individual costs. They are elements used daily, are easy to obtain, and support business operations.

3. Leverage commodities are services and products with a high volume of consumption, freely available with a wide range of alternatives, and very important to business operations in that they represent a substantial expense.

4. Bottleneck commodities have complex specifications and manufacturing processes. There are not many alternative products or supply sources, and their shortages seriously affect operations.

Portfolio and spend analysis are useful tools to develop supply chain strategies and provide data and supported decisions to be disseminated to the rest of the chain to allow its proper alignment.

2. Supply Chain Performance Measurement

Performance measurement inside a supply chain, and as a whole, improves decision making, and is based on objective data. It facilitates the way in which requirements are communicated within the chain, and allows improvements by providers once deficiencies are detected. From a strategic point of view, performance measurement shows the alignment of the supply chain with strategic objectives and customers' expectations, and can be used as a control tool to determine the effect of any decisions adopted in the improvement process. Some obstacles in the measurement system definition are the use of too many metrics, the use of old data, and the tendency of frequently changing metrics. That is important at the strategic level to define what needs to be measured, how it will be measured, and how the data obtained will be used (Monczka et al., 2009). Some examples of indicators used inside the military logistics organization include perfect order fulfillment, supply chain response time, inventory turns, weapon system sot-mission capable rates, and war reserve ratio (Logistic Management Institute, 2000).

3. Supply Base Optimization, Chain Integration, and Management

The selection, evaluation, and development of suppliers that are part of the supply base have transcendental consequences in final product characteristics. Companies obtain from suppliers the elements and services required in their productive process that satisfy the needs of final customers, and that level of satisfaction is conditioned with how those inputs are provided at the right price, from the right source, meeting user specifications, at the right quantity, and in a timely manner. Because supply management provides a competitive advantage overseeing the relationship and the flow of resources inside the supply chain, organizations have to be able to select competitive suppliers, identify and develop new potential ones, develop close relations with providers, eliminate those who do not perform accordingly, and enhance qualified providers. The efficiency of the productive process relies upon the quality of suppliers and the relevance of their selection, development, maintenance, and evaluation. Moreover, the proper supplier development and management promotes a stronger future marketplace requirement.

An accurate provider evaluation and selection will reduce purchase risk and is the "established foundation upon which to further develop and improve supplier performance" (Monczka et al., 2009, p. 272). The early involvement of suppliers in the concept, pre-design, and involvement of new product development has a transcendental relevance in reducing costs, risks and uncertainties during the initial stages of production, thus early vendor selection is necessary. The evaluation used to select suppliers has the following three primary criteria (Monczka et al., 2009, p. 255).

1. Management capability: Determine the professional management capabilities inside the supplying organization.

2. Employee capabilities: Define the degree of commitment to quality, continuous improvement, skills, motivation, flexibility, work environment, morale, and other important characteristic and competences of the workforce.

3. Cost structure: Understand the supplier's cost structure to determine potential cost improvement areas, the level of efficiency in cost control, and the overhead cost allocation method.

Supply base rationalization and optimization is the continuous process that analyzes the current supply base to determine its numbers, and which will demand a higher performance. Provider evaluation and its results will be the foundation of an adequate supply base rationalization. Once buyers have selected their suppliers, another factor to consider is the number of providers that companies will maintain in the supply base. The old concept that a broad selection base will bring competition that translates into cost reduction, has been changed to a search for a few highest performing suppliers and establishing with them a long-term and close relationship. Additionally, fewer suppliers will receive large volume contracts providing a cost reduction brought from economies of scale. Because the reduction of the supply base and the settlement of long-term relationship increase the cost of changing supplier given the mutual dependence generated, it is important to make a proper decision about which providers will form part of the supply base.

Provider performance evaluations must be a continuous and permanent buyer process to determine supplier capabilities, and to satisfy their contractual obligation and

ground supply base adjustment. The data obtained in these evaluations promotes the correct administration of supply bases and the supplier management and development. When evaluation results determine that providers capabilities are not good enough to meet customer requirement, and it is not the intention to eliminate it from the supply base, the option arises to develop and improve its competencies through close and cooperative work. Different parameters are used in the selection process of performance evaluation. The following measurement categories are defined and linked with pre-established standards, along with historical supplier records (Monczka et al., 2009, p. 317).

1. Delivery performance: Quantity, lead time, and due-date compliance will be a part of supplier delivery performance.

2. Quality performance: Quality is evaluated based on product specifications and improvement trends.

3. Cost reduction: One of the supply chain objectives is to share cost and benefits. An appropriate cost allocation, suppliers cost comparisons, and tracking costs, will help in this mission.

The data collected in the provider performance evaluation process is useful information to analyze in conjunction with suppliers making necessary adjustments in the production process in accordance with strategic objectives, and to satisfy the customer. Also, this analysis brings capabilities and overall improvements to the supply chain, which must be carried out not only by purchasing personnel, but must include cross-functional groups with marketing, engineering, and finance for total integration of production processes.

Close connections between suppliers and buyers provide benefits to the supply chain of cost savings, reduction of risk on disruption, and improvement in delivery that ultimately results in an increase in value for the customer. This integration must materialize by different internal groups such as operation, finance, engineering, logistics, and customer service to develop the capabilities required in both sides to lead the competitive performance. Integration is defined as, “the process of incorporating or bringing together different groups, functions, or organizations—either formally or

informally, physically or by information technology—to work jointly and often concurrently on a common business-related assignment or purpose" (Monczka et al., 2009, p. 118). Prior definition incorporates the joint work between suppliers and buyers to resolves the difficulties using different perspectives, for which expertise and personal competences in the working groups are required. The integration requires mutual trust to share information; much of which is confidential, such as the cost structure and production processes, and long-term contracts that provide stability in the relationship.

Following are the common methods applied by supply management to accomplish integration (Monczka et al., 2009, p. 119).

1. Cross-functional or cross-organizational committees and teams
2. Information systems such as video conferencing and webmail
3. Integrated performance objectives and measures that drive a common goal
4. Process-focused organizations that are dedicated to a certain process
5. Co-location of suppliers and customers
6. Buyer or supplier council that provide inputs and guidance to the steering committee

4. Organization, Authority, and Hierarchy

Big organizations, such as the Chilean Navy, have to define an optimum location for the authority of purchasing decisions, which can be centralized or decentralized. A centralized purchasing authority is present where corporate headquarters defines the majority of purchases; on the contrary side, it is a decentralized purchase authority location in the case where divisions, business units, or site level determine the majority of acquisitions. Some factors that should be considered when determining the location of an authority decision include coherence between authority position and strategic efficiencies, reaction speeds, cultural factors, and levels of competition. Other factor to consider is the degree of similarity or homogeneity of the purchases in different units, being appropriate a centralized authority location when this exists. Meanwhile, a high amount of expenditure will create pressure for a centralized decisions authority. Both centralized and decentralized procurement authorities have benefits to be considered prior

to deciding on their location. Centralized purchase power benefits a consolidating acquisition by increasing volumes, reducing costs, reducing the duplication of purchasing effort, developing a specialized expertise among purchasing teams. Decentralized purchasing increases the response time, spreads the knowledge of the process and local operating requirements, and facilitates a new product development (Monczka et al., 2009, pp. 160–161).

A combination of centralize and decentralize purchase authority location is also applicable, trying to obtain the benefits of both. A center-led authority location combines the centralized approach of the acquisition of common items of different business units, with the decentralized method for those exclusive things. Today, center-led organizations are the most popular structures used by large firms (Monczka et al., 2009, p. 159).

The organizational structure adopted by the company affects the performance of supply chain management, and adapts to meet the business strategy. Its definition helps to explain how a company communicates and integrates its decision making across the organization. The organization design defines the location of purchasing in the hierarchy of a different organization, and assigns different functions of supply management: sourcing and negotiation, market analysis and research, operational support and order follow-up, and administration.

E. SUMMARY

Supply management is a valid source of competitive advantage, producing cost savings and increasing efficiency when it is sustained by foundational principles. These foundational concepts are strategic formulation, performance measurement, supply base optimization and management, and adequate organizational structure.

Supply chain strategy formulation must be handled by sourcing, demand flow, customer service, and supply chain integration. Spend and portfolio analyses are valuable resources to systemize and present the information of the elements and services acquired with its trends and relevance to build the sourcing strategies for different acquisition categories. Performance measurement improves the decision-making process to maintain objective data and help to communicate the objectives to supply chain for control and

deficiency detection. Supply base optimization and its management allow increased efficiency of the productive process once the supplier obtains appropriate quantity and quality. An adequate supply base management requires a provider selection and performance evaluation.

Selection of organizational structure and the location of purchase authority impact the response speed and adaptation capabilities to change in the environment. Coherence between strategy and these elements are critical factors in the supply management process. Supply management is the administration of a supply chain that permits the adequate exchange of resources and coordination of activities inside the chain. The strategic plan aligns the organization to reach a common goal and establishes a method of coordinating those activities between its members to obtain a competitive advantage in accordance with strategic goals of reducing costs, providing service excellence, reducing lead and product development time. Those benefits are obtained through the synchronization of activities, collective planning, and resource sharing inside supply chain; what have been facilitated by Internet, the increment of information available and its process capability.

How companies manage their supply chain relationships, and the coordination of their activities, affects their cost and effectiveness. Through the implementation of supply chain management theory and its foundation, military organizations can obtain a competitive advantage by obtaining and maintaining national defense capabilities more effectively.

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III. CHILEAN NAVY ACQUISITION SYSTEM

The procurement process and the activities associated with supply management detailed in the previous chapter are located inside defense organizations under the military concept of logistics. Henry Eccles (1997, p. 42) defined the objectives of logistics as, "the creation and sustained support of combat forces." For its part, Martin Van Creveld defines military logistics as, "the practical art of moving armies and keeping them supplied" (1977, p. 1). Therefore, the Chilean Navy defines logistics as, "logistics is part of the art of war which aims to provide armed forces the means of personnel, material, and services required to meet the demands of the war in quantity, quality, time, and place" (Amada, 1986, p. 101–1)

Supply is the central axis of material logistics because its effective and efficient actions will ensure the operational capacity of the fighting forces to provide them with the elements, equipment, spare parts, and consumables needed to sustain operation. According to the Manual of Logistics of the Chilean Navy, material logistics tasks are divided into the following functions: supply, maintenance, shipping, and facilities. The supplies are defined as those that "provide the items needed to equip, sustain, and allow the operation of the forces and support organizations" (Armada, 1986, p. 403-1).

The Chilean Navy acquisition system is based on the organization and rules that set out their objectives, procedures, attributions, and tasks. That organization employs financial resources assigned by government by means of the annual budget law to acquire from the market the elements for obtaining and maintaining national defense capabilities. This chapter will describe the regulations and the organizations employed by the Chilean Navy to solve its material and service requirements by obtaining from external entities through the logistics system. In general, the Navy logistical organization is divided into Directorates and Services charged to regulate and establish standards and acquire materials of a particular nature.

A. CHILEAN NAVY ACQUISITION ORGANIZATION

The main purpose of the Chilean Navy Acquisition structure is to provide the material and technological resources to the Navy. The Director of Logistics is responsible for that mission, and its purpose is accomplished through subordinates that are dependent upon Directorates, Missions, and Services, as displayed in Figure 2. Each of these supports the material of the navy and details the roles and missions of those related to the acquisition processes associated with their sphere of competence (Armada, 1986, p. 302 - 1).

Directorate of Logistics: The Directorate of Logistics of the Navy *(Director General de los Servicios de la Armada*) is the agency of the highest institutional level in matters of materials logistics, and it reports to the Chilean Navy Commander in Chief. The administrator of the resources is employed to obtain and sustain the capabilities that the Chilean Navy requires to accomplish its mission (Armada, 1986, p. 104 - 7). The principal function of the Directorate of Logistics is to issue the policies and doctrines related to the management of materials including: acquisition process, support, development, disposal, and oversight of the control system. In addition, it includes the development of inventory and control regulation to manage the material life cycle.

Directorate of Supply: The Directorate of Supply acquires the majority of the elements that the navy needs to develop its activities, including the maintenance and operation of the procurement system to provide support and services of excellence to the naval forces and facilities. Their functions include meeting the needs of spare parts, supplies, clothing, and food, as well as household materials, general equipment, regulation and maintenance of the operation procurement process. It manages the fuel employed by ships, airplanes, vehicles, and its inventory, and it runs the procurement of those goods and services. Finally, it is responsible for the selection, evaluation, and qualification of suppliers and the disposal of the materials. In the accomplishment of their obligations, the Directorate of Supply follows the policies and regulations established in laws and those set by the Director of Logistics.

Directorate of Naval Systems: By helping to ensure the highest available reliability and efficiency of the naval systems, the Directorate of the Naval Systems exercises the highest technical authority of the engineering systems, weapons systems, and command and control systems that are operated in the units of the Navy. Their functions include issuing technical standards for the conduction of the maintenance, repair, and operation of naval systems; they manage projects from design, replacement, and modernization of naval systems; and maintain the inventory of all the naval system assets.

Directorate of Research and Development: The Directorate of Research and Development leads the research activities and materializes the force development programs. Research activities are those oriented to develop new technologies to solve navy requirements and development programs that focus on the renewal and update of ships, submarines, aircraft, and their systems that relate to maintenance plans corresponding to the respective directories.

Chilean Naval Missions: Chilean Naval Missions perform all activities related to global sourcing inside its geographical jurisdictions. Their personnel search for potential suppliers and execute activities to purchase and transport to Chile the supplies required by logistics systems. The Chilean Navy has established their Missions in the United Kingdom and the United States to meet the requirements of materials and services requested by their technical Directorates and Services in quantity, price, and timing that cannot be set up in Chile. They liaise with representatives of government and private companies in the country of residence to obtain information and technical advice for improving systems of the institution. Missions represent the Chilean Navy quoting, assessing, and allocating material requirements presented by its technical divisions, and represent the technical testing and evaluation of acquired or repaired systems in the area of responsibility. Naval missions research the market and update the register of suppliers, and liaise with the technical agencies of the armed forces of the resident country to manage the transfer of technology.

Directorate of Telecommunications and Informatics: The Directorate of Telecommunications and Informatics is the highest level agency related to the management and exchange of information to contribute to the execution of the conduct of the naval operations and the administration of the Navy. In the accomplishment of its responsibility, the Directorate has been assigned to the following tasks in relation to the communications elements, processing, and transmitting information.

- Supervise the proper operation of the communication networks,
- Lead the implementation of renovation projects and upgrading of communication networks,
- Define technical norms and standards,
- Manage the processes of procurement, distribution, and elimination of material destined for the processing and transfer of information.

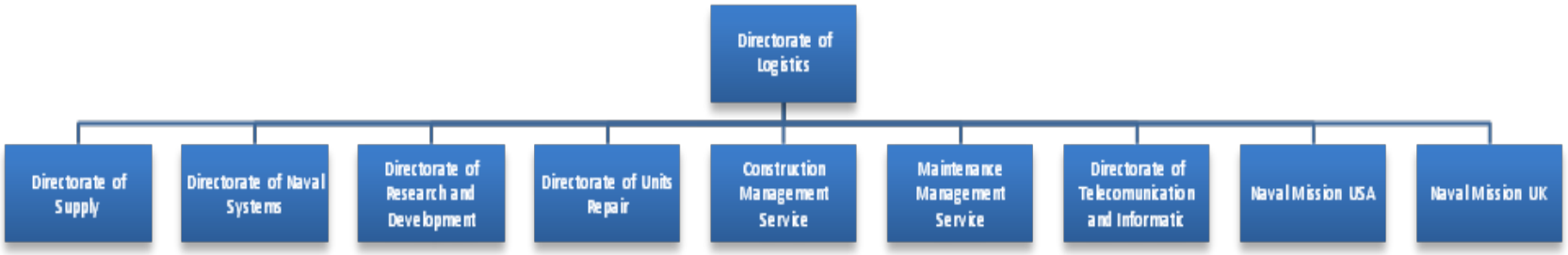

Figure 2. Chilean Navy Logistics Organization

B. CHILEAN NAVY ACQUISITION REGULATION

Chilean navy acquisition regulations set the procedures and norms to accomplish in the procurement process. They are laid down in laws that are valid for all state agencies and other individuals for the military institutions. The description of these norms will be carried out based on the establishment of the governing principles of the processes of acquisition and the specific related laws, and later description of the norms in particular.

1. Legal Background

In the accomplishment of their obligations, the Chilean government agent can perform just what is established by the law; in other words, the government can only do what the law allows or dictates. Respect for the principles that emanate from the concept of the rule of law has become wide spread. The law should govern a nation and not arbitrarily rule through decisions made by individual government officials. In this way, the public law is that which regulates the relationships between the government and individuals in a mandatory way.

The principle of the rule of law manifests itself as the duty of state officials to be bound by the law, rather than acting on a whim. The branch of the public law that governs these rules is administrative law. Administrative law maintains legal principles that govern the administrative activities of the government such as acquisition of goods, and contracting of services required for the operation of the administrative agencies.

The laws and norms that regulate the procurement process are founded in principles that accomplish the requirement established in the administrative law that apply to all the Chilean state agencies. Those principles include the following.

Economic criteria: To obtain the highest benefits possible when acquiring goods and hiring services at the lowest present and future cost. This principle explains why all the conditions that impact the expected benefits from those goods or services are taken into consideration, and not just the price is the only consideration to decide among different offers.

Equality of offers: The buyer shall give equal treatment to all bidders by dismissing the establishment of arbitrary differences between them. This principle requires that from the beginning of the procedure to the formalization of the contract, all the offers are in the same situation, and are provided with the same information. It demands from the administration a strict fidelity to the solicitation document and an explicit knowledge of the offerors and of the public in general of how, when, and where the hiring and contractor will determine the administration.

Publicity and transparency: Publicity will be the ideal tool to achieve high transparency levels. Management must be public and provide suitable procedures when selecting contractors. The general rule of acquisition is the public solicitation process, which dictates that any interested party can take part in the public contract negotiation. Another expression of this principle is the existence of a contractor's record, as well as that of an electronic information system and intermediation in the matter. Administrative agencies governed by this law must quote, tender, contract, award, request the firm, and develop all processes of acquisition and contracting of goods, services, and works referred to in the present law, using only the electronic or digital systems that are established by the Directorate of Public Procurement and Contracting. They cannot award contracts from offers that have not been received through the electronic or digital systems established by the Directorate of Public Procurement and Contracting.

Contractor suitability: Although any national or foreign citizen can be hired by the Administration through respect of the equality principle, they must comply with the requirements of professional, technical, and financial suitability that guarantee normal functioning of the government agencies.

Strict subordination to the solicitation document: In case of a discrepancy between the contract and the solicitation document, they must give priority to the latter because it constitutes a guarantee of the equality of dealing that must govern the relation with the offers. Furthermore, the solicitation document details provide specific contract clauses that must be adhered to.

Administrative probity: In the Chilean administrative ambience, the integrity consists of observing an irreproachable conduct and an honest performance of a function with preeminence of the general interest over the individual. In the acquisitions process it is considered a violation of this principle to ignore or avoid a solicitation process.

2. Budget Law

The Chilean Budget Law is a financial estimate of income and the authorization of expenditures for a given year. The budget is approved through the law by Congress before the end of the year, and prior to the execution of the law. The Treasury assigns the funds in relation to the classification of expenditures. Instructions are included for the budget administration, which indicate that certain powers and prohibitions exist to prevent borrowing above the legal framework.

The Budget Law also sets regulations and procedures relative to the expenditure authorization period, and verifies that those goods or services can be contracted with the allocated resources. It establishes that accounts of the financial year shall be closed by December 31, so that payments can be made from the existing budget by January 1.

The funds allocated by the Budget Law are deposited into the accounts of the various state organizations according to the reason of the expenditure, and are classified according to the minister and the agency authorized to incur the expenditures. The amounts allocated are accounted for under the budget headings that represent the various government ministries. Next, they are subdivided into chapters that define public services or subsectors within the budget headings, programs, or specific assignments within the chapter, and subtitles and items that contain in detail the income or expenditure authorization. The governmental agencies may not make any payments except by virtue of a decree or resolution issued by the competent authority, stating the law or which part of the budget authorizes the expenditure (budget availability certificate).

3. Law Number 19,886 of July 7, 2003, on Contracts of Supply and Rendering of Service and its Regulations

In 2003, the Chilean government reformed its acquisition system creating the *Dirección de Compras y Contratación Pública,* also known as *ChileCompra* (Directorate

of Public Procurement and Contracting). This directorate is under the Treasury, with the mission to set rules and procedures to all governmental entities related to the acquisition of goods, contracting of services, management of digital platforms, and support of the system. *Chilecompra* operates the following four platforms (ChileCompra, 2014a).

MercadoPublico.cl (Public-market): the bidding platform, where governmental agencies execute their purchases and suppliers can sell their products and services to the State. Also includes the virtual shop called framework agreements, "*ChileCompra Express*," which facilitates the work of the buyers of the state providing the products and services of greater demand at convenient prices and favorable terms.

ChileProveedores.cl (Chile-suppliers): the suppliers' register of the state, where companies can maintain their accredited and digitized information.

Analiza.cl (Analyze): The Platform for Business Intelligence, where citizens and businesses can analyze market niches and business opportunities with the state.

Comprassustentables.cl (sustainable procurement): those procurements in which the purchase decision is associated not only economically, but also socially and environmentally, and which are applied to the entire life cycle of the product or service. This platform provides the policies of sustainable public buys of the State of Chile, and helps providers remain sustainable (ChileCompra, 2014b).

Law number 19,886 states the framework of the Chilean governmental procurement system that integrates its management agencies and the regulations of the contracting of goods and rendering of services for all the agencies of the Chilean government that require the development of its functions. The Law sets the following norms and entities (Chile, 2003).

a. Contractors and Procurement Procedures

Can contract with the government people or corporations, Chilean or foreign, which prove their financial viability and technical suitability. Excluded are those who have been convicted of anti-union practices or infringement of the fundamental rights of the worker, within the preceding two years.

The first option where the public entity must search to procure the elements and services needed to accomplish their goals is through the virtual shop "*Chilecompra express."* It is a hiring procedure, carried out by the Directorate of Public Procurement and Contracting, to procure the direct supply of goods or services to institutions using the terms and conditions set forth in this agreement. When the goods do not exist in the virtual shop catalog, the entity must continue with the procurement process through a public solicitation.

The Administration awards the contracts held by a solicitation process (full and open competition), a limited solicitation process (at least three offers invited), or direct contracting (single source). The solicitation document should establish conditions for achieving the most advantageous combination of all the benefits of a good or service for purchase with present or future costs, and may not establish arbitrary differences between proponents. In any case, management must tend to the efficiency, effectiveness and savings in their procurement.

Solicitation process (public bidding or proposal): an administrative tender procedure for calling on interested parties to submit proposals subject to solicitation documents or bases. From all the proposals that meet the base, one is selected and accepted.

Limited solicitation process: An administrative tender procedure, through which the administration invites certain persons or organizations to submit proposals subject to a solicitation document that determines the most suitable solicitation to be accepted. This is an exceptional procedure that has to be founded in a resolution document.

Single source (direct contracting or direct negotiation): the procurement procedure that is made without the concurrence of the requirements stated through public bidding or limited solicitation process.

The law allows just in the following cases the occasion to execute purchases through a limited solicitation or single sourcing procedure:

1. When respective public tenders have not been submitted

2. When contracts that correspond to the completion or termination of a contract are resolved or terminated early due to lack of compliance with the contracting document.

3. When there is an emergent, urgent, or unforeseen reason for the superior head of the procuring entity to make a decision.

4. When there is only one supplier of a goods or service.

5. When a servicing agreement is conducted by foreign legal entities to be performed outside the national territory.

6. When the service is confidential or the disclosure of which could affect the security or national interest, which shall be determined by Decree.

7. Where, by the nature of the negotiations, there are circumstances or characteristics of the contract that make it necessary to go to direct contracting with a single source.

b. About the Required Surety in the Acquisition Process

The respective bidding entity will require the constitution of bond necessary to ensure the seriousness of the tenders submitted (Bids bonds) and the faithful and timely fulfillment of the final contract (Performance bonds), in the form and by the media that are established in the respective bidding rules. The bonds that are necessary to ensure the offers, and the faithful and timely fulfillment of the final contract, shall be fixed in such an amount that does not discourage the participation of bidders in responding to the call for tender or proposal.

c. The Register of Contractors

There will be an electronic record of official contractors managed by the Directorate of Public Procurement and Contracting. This register shall be open to the public. The bodies of the Governmental Administration shall publish in the information systems the basic information relating to their procurement. Such information must be complete and timely referring to calls for bids, receipt of bids, clarification, answers, and modifications to the bidding rules, as well as the results of the awards relating to procurement and contracting services.

d. The Court of Public Hiring

The Court of Public Hiring is competent to hear appeals arising from alleged illegal or arbitrary acts or omissions that could have happened in the administrative hiring procedures by government agencies ruled by this law. Any supplier could use this action if in his opinion the government agency acted against the law during the approval of the document of the respective tender and its awarding. In the definitive judgment, the Court will rule on the legality or arbitrariness of the act or omission and will set the measurements that are necessary to restore the rule of law.

e. The Directorate of Public Procurement and Contracting

The Directorate of Public Procurement and Contracting is the governmental agency that "facilitates the hiring of goods and services to the institutions of the state, connecting its needs with the offers of the providers, through the *Chilecompra* system, promoting a transparent, honest, accessible, and inclusive market" (Dirección ChileCompra, 2014). Following are the functions of the Directorate.

1. To advise the government agencies in the planning and management of its processes of buys and hiring.

2. To operate the information system and other means of purchasing and electronic hiring of public organisms.

3. To obtain information regarding background records of contractors and providers.

4. To bid goods and services through the subscription of framework agreements with respect to governmental organisms obligated under this agreement to interact directly with the contractor awarded by the Directorate. When some agency obtains more advantageous conditions than established into framework agreement, it is exempt from using Chilecompra and must report it to the Directorate.

5. To administer and to maintain updated Register of Contractors and Providers.

6. To promote the maximum possible competition in the acts of procurement of the administration, and developing initiatives to incorporate the largest bid from the contractors.

7. To establish the policies and conditions of use for the hiring procedures and electronic or digital information systems.

f. Detailed Procedures

Law Number 19,886 on Contracts of Supply and Rendering of Service has supplementary rules that determine detailed procedures to execute the purchase and disposal of goods, establishing the obligation of the solicitation process to all cases. The use of any other procedure distinct to the solicitation process as limited solicitation or single source process is considered as an exception and shall be justified through a founded document (resolution) that justifies and approves this action. Those features include periods and deadlines for processing bids, details of the documentation required in each bidding process, the bids evaluation criteria, communication procedures, the procedures to notify awards, and protest procedures.

4. Law Number 18,928 of February 13, 1990, that Rules the Acquisitions and Disposal of Corporal and Incorporeal, and Movable Services by the Chilean Armed Forces

Law number 18,928 empowers the Chilean Navy Director of Logistics, on behalf of the Treasury, to carry out the acquisition of goods and contracted services, and the disposal of tangible goods. He may delegate this power to another officer through a founded resolution.

The law establishes power to the Director of Logistics to allow a sole source purchase, exempting the public proposal process, in the following cases.

1. When the materials are of such nature that their purchase cannot be subject to tender, and there is no opportunity to ask for public proposal.

2. When there are articles that should be purchased directly from the producer.

3. When proprietary articles abroad and are acquired by direct contracts with the manufacturer or its representatives.

4. When there are urgent cases or contingencies related to the purchased goods.

In general terms, this law establishes the authority to perform the acquisition process to the Chilean Navy and allows the omission of the procurement process by public proposal as befits the general case. All remaining acquisition processes are performed under the provisions of Law 19,886.

5. Chilean Navy Directive of the General Procedure for the Procurement of Goods and Services Contracting

Through this directive, the Chilean Navy Directorate of Logistics establishes rules and procedures for the process of procurement of goods and services by the institution to accomplish all the laws detailed previously, and other internal regulations related to logistics support of operative forces.

The acquisition process begins by adding a request into the Chilean Navy ERP system, which includes technical specifications, quantity, catalogs, schedule, budget availability certificates, and all information required for a successful procurement. Based on the nature of the necessity, the requirement will be directed to the specific logistics organization (Directorate) in charge of its acquisition. If the element is in stock, it will be delivered to the end user and continue through the procurement process to replace it. That requirement is stated in the solicitation document that regulates the solicitation process.

The directive includes instructions for material solicitations abroad by the Chilean Naval Missions, whose procedures complies with the principles set forth previously, but differs from those executed in Chile in response to the conditions and rules of other countries, and from the impossibility to use the *ChileCompra's* platforms abroad.

C. SUMMARY

The following regulations set the procedures used by Chilean Navy in the acquisition of goods and contracting services, they are constituent by laws and other applicable just to Armed Forces.

1. The Budget Law is a financial estimate of income and the authorization of expenditures for a given year. The law also sets regulation and procedures related to the period to expenditure authorization, and allocate the funds into accounts according to the reason of the expenditure and its particular nature.

2. Law number 19,886 sets the rules and procedures to all governmental entities related to the acquisition of goods and contracting of services, and manages the digital platforms that support the system.

3. Law number 18,928 rules the acquisitions by the Chilean Armed Forces empowered by the Chilean Navy Director of Logistics to carry out the acquisition of goods and hired services, and to allow a sole source purchase, exempting the public proposal process for specific cases.

4. Chilean Navy Directive of the general procedure for the procurement establishes rules and procedures for the process of procurement of goods and services in accomplishment of all regulations states previously.

In the accomplishment of their obligations, the Chilean government agent can perform only what the law establishes for them. The laws and norms detailed previously are founded in principles that apply to all Chilean government entities. Those principles include economic criteria, equality of offers, publicity and transparency, contractor suitability, strict subordination to the solicitation document, and administrative probity.

The Chilean Navy Acquisition organization has as its main purpose to provide the material and technological resources required for accomplishing its mission; and it is the Director of Logistics who is responsible for leading those activities. The organization is constituted by Directorates, Missions, and Services in charge of the support of the material, and performs acquisition processes associated with their systems categories.

The procurement process and the activities associated with supply management are included under the military concept of logistics. Supply is the principal activity of the material logistics, while its effective and efficient actions will ensure the operational capacity of the fighting forces.

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IV. SUPPLY MANAGEMENT ANALYSIS OF CHILEAN NAVY ACQUISITION SYSTEM

We have developed the theoretical fundamentals around supply management and the structure of the procurement system of the Chilean Navy. In Chapter II was stated the importance of supply management as a real source of competitive advantage, and in addition were recognized as its founding principles: the strategic formulation; supply chain performance measurement; supply base optimization and management; and setting an adequate organizational structure. The proper implementation of these concepts makes the procurement process more efficient because it becomes faster, less risky and cheaper. Chapter III described the Chilean Navy acquisition system with the aim of understanding its structure and regulations to recognize how the foundational principles of supply management can be allocated and applied in that acquisition system.

This chapter analyzes the Chilean Navy acquisition system contrasting its current structure, regulations, and procedures with the founding principles of supply management established as a theoretical framework for the study. The results obtained will be used to formulate recommendations to improve the Chilean Navy logistics organization and its procurement process across the adaptation and incorporation of supply management concepts.

A. ORGANIZATIONAL STRUCTURE AND PURCHASE AUTHORITY LOCATION

In accordance with the type of organizational structure and location of the purchase authority, it is possible to affirm that the Chilean Navy logistics organization corresponds to a center-led type structure, but with an inconsistency in the adequate delegation of purchase authority based on maximum monetary amount and inadequate regulation of complex purchases that require the intervention of more than one Directorate. The Chilean Navy logistics organization and the acquisition process are distributed in Directorates and Services based on a family of systems to support. Although Law 18,928 authorizes the Director of Logistics to carry out acquisitions, this power is delegated to the various components of the organization. That spreading of

authority in specialized divisions retains the benefits of a centralized structure through leveraged purchasing volume, reduction of duplicate purchasing efforts, development of a specialized expertise in purchasing teams, and rapid response from decentralized systems (Monczka et al., 2009, p. 162). It is important to mention that the current authority delegation is based on a ceiling price for the acquisition, instead of limiting it based on the characteristics of materials or services to procure to be consistent with a center-led procure authority organization, and it has to be considered that the ceiling was already assigned in the annual budget. Today acquisitions that exceed the ceiling are performed by Directorate of Logistics does not have the competency to add value to the process. Correcting this system would accelerate the processes of acquisition in the cases that exceed the amount currently established as a ceiling; increasing the compromise of the Directorates and Services to hold them responsible for the same product category, and restricts operational tasks of the Directorate of Logistics to concentrate on regulating and oversight.

1. Recommendation 1

The delegation of authority for buying goods and services by the Director of Logistics must be exercised on the basis of the nature of these goods and services, and not according to the their total money amount.

Another difficulty arises when the purchase or service contract is of such nature that it needs the cooperation of two or more Directorates or Services. In these cases, cross-functional or cross-organizational teams are required to accomplish the integration into the procurement process. The Directorate of Logistics has a crucial role in this process at the higher organization level, and has the authority to order the implementation of cross-functional teams and manage their work.

2. Recommendation 2

Within the obligations of the Directorate of Logistics, include leading the processes of procurement of goods and contraction of services that go beyond the scope of competence of a single Directorate or Service, through the formation of cross-organizational teams.

B. SUPPLY BASE OPTIMIZATION, CHAIN INTEGRATION AND MANAGEMENT.

Current Chilean Navy procurement regulations do not specify the evaluation criteria for suppliers, allowing different entities to set the requirements needed for the selection of providers. Because the Chilean Navy obtains the goods and services required to accomplishment its mission from external sources, the efficiency in the development of its activities will be conditioned on quality and timeliness by providers who meet its requirements. Therefore, there is a need for a careful process of selection of suppliers to reduce risks associated with any acquisition. According to Chapter II, selection criteria for the evaluation of suppliers include management capabilities, employee capabilities, and cost structure.

Law 19,886 does not provide details on how the selection of suppliers should be executed or what criteria to use, but indicates in a generic way that the solicitation document should include "the requirements and conditions to be fulfilled by bidders to make their offerings acceptable, as well as the suitability and qualification of the offers" (Chile, 2003). Regarding the technical suitability and finance of the bidders, the law indicates that this will be credited according to the information available on the National Register of Suppliers at www.ChileProveedores.cl. Prior to being incorporated into the Register, the Directorate of Public Procurement and Contracting verifies whether there are any incompatibilities related to contracting with the entities, or issues with the legal or financial situations of the registered vendors. These provisions leave open the possibility of including other criteria for the selection of suppliers such as those mentioned above. Current law requires only the strict adherence to the principles that founded the procurement process as equality of offers, publicity and transparency, contractors' suitability, and strict subordination to the solicitation document.

1. Recommendation 3

Where appropriate, the entities shall include supplier selection criteria within the solicitation process beyond the minimal criteria demanded by the law to

reduce purchase risk. Some applicable evaluation criteria are supplier management capability, employee capabilities, and cost structure.

Once suppliers are selected and goods are acquired or services received, it is necessary to evaluate the performance as a main element for the proper administration of the supplier base, its rationalization, and optimization. It is necessary to determine the optimum supply base number for the highest-performing suppliers, to continue their relationship. Law 19,886 suggests supplier performance evaluation as criteria, but does not require this evaluation nor state the manner in which it must be executed. Necessary criteria include timeliness, quality performance and compliance for the products or services provided, and consistency of these in relation to the request in the technical specifications of a process acquisition. Meanwhile, Monczka et al. indicated that measurement categories for supplier performance records include delivery, quality, and cost reduction (2009, p. 317).

2. Recommendation 4

Incorporate in the acquisitions and contracting closeout as a mandatory requirement for the buyer agency to carry out the evaluation of the vendor's performance. This must include at least the factors of timeliness, quality, and compliance performance in relation to the request in the technical specifications. Their results must be communicated to the supplier and be incorporated into the historical backgrounds to be recorded in the *chileproveedores* system. The results of this evaluation have to be used as evaluation criteria for further supplier selection.

Some of the Chilean Navy acquisition regulations noted in Chapter III obstruct the supply base rationalization because they are opposed to the principles of transparency and equality of offers and the budget execution rules; therefore, it is difficult to implement a long-term relationship with suppliers using the current regulations. The purpose of supply base rationalization and optimization is determined by the number of suppliers for specific items or services, as well as which highest performing supplier be kept. Provider evaluation and its results will be the foundation of an adequate supply base rationalization to determine those highest performing suppliers, and establish with them

long-term and close relationships. The integration requires mutual trust to share information and long-term contracts that provide stability in the relationship. With regard to this aspect, the Chilean Navy acquisition regulation set a series of guidelines that goes in the opposite direction.

The obligation to execute spending within a year is an obstacle to the establishment of long-term relationships, because the annual provision of funds does not ensure the availability of resources in following periods necessary for the procurement of services and acquisition of goods that exceed the fiscal year. Long-term contracts are drawn in exceptions that must be supported properly and include exit clause in case of not be assigned the corresponding resources. In addition, the requirement to carry out public tenders for all processes of acquisitions or contraction of services are required, not ensuring that the new acquisition is awarded to the previous provider. In Chapter III, we detailed the causes of direct contracting that do not include logistics' continuity or the good performance of the previous supplier. The rules ensuring transparency and equal treatment of bidders make it difficult to implement long-term relationships with suppliers.

C. SUPPLY CHAIN PERFORMANCE MEASUREMENT

The Chilean Navy logistics organization has not developed a system that permits a direct measure of the performance of a supply chain, despite the availability of data in the ERP system. Effective performance measurement acts as a control tool over the supply chain through the evaluation of strategic goal achievement, which allows detecting flaws and opportunity for improvement (Monczka et al., 2009). Existing Chilean Navy logistics processes include the measurement of supplier performance through availability of systems, which indirectly provides performance data of the supply chain as a whole. The Chilean Navy system for measuring the performance of supply chain has to be capable to obtaining reports that permit analysis of the achievements of the purchasing processes based on specific metrics. The metrics should include the use of current and accurate data based on user requirements, that do not imply more administrative work (automated), and to maintain them over time to achieve certain necessary stability to identify trends. Some of the metrics possible to be implemented are

the supply chain response time according with users' requirement to be completed and perfect order fulfillment based on user initial requirement.

1. Recommendation 5

Implement a supply chain performance measurement process that initially includes the supply chain response time according to users' initial requirements, and based on order fulfillment. The process must be customer-centered using the current ERP system, without the needs for excessive administrative work.

Further use given to the results of these measurements, and their consistency with the objectives set out in the strategic planning, is as important as the selection of the metrics used to measure the organization performance. The results obtained in the performance measurement have to be used to detect failing, bottlenecks, and deficiencies in the knowledge of the staff or the rules. When possible, these results could also be included with the evaluation process of the staff, thereby aligning individual and organizational performance.

D. SUPPLY CHAIN STRATEGY

The supply chain strategy formulation requires consistency with the Chilean Navy operation and development strategy, and is based on historical data of the budgetary allocations and requirements for Chilean Navy goods and services. Along with this formulation, spend analysis is presented as a powerful tool to generate a broad perception of the end-user requirements. Supply chain strategy is a plan that determines how it will satisfy the customer's needs in concordance with Chilean Navy operations and development strategies.

In Chapter II, the supply chain strategy formulation was defined by sourcing, demand flow, customer service, and supply chain integration perspectives. Through Armed Forces activities, unlike the business environment, this study focuses on a sourcing strategy. That requires having clarity on the services and goods needed by the Chilean Navy in a time-period and their providers, for which spend analysis it presents as a useful tool to understand how principal providers and how purchase volume is

distributed. Also, the application of spend analysis helps realize what are the goods purchased and contracted services, their strategic importance, and if there are opportunities to standardize products and concentrate acquisitions.

1. Recommendation 6

Each Directorate and Service performs an analysis of annual expenses, and based on them, the Directorate of Logistics generates a consolidation of Chilean Navy acquisitions for that period. Further, the Directorate should be responsible for analyzing the information and generating instructions to optimize the acquisition process for the next period. The ERP system must be programmed to automate this task.

Once consolidated, the information on expenditure incurred and products or services purchased from the suppliers is collected; it becomes possible to initiate the process of formulation of the sourcing strategy through the model of portfolio analysis. The products and their suppliers are classified according to the complexity of the acquisition and the value generated to the user, configuring four products categories for which particular acquisition strategies can be established. The portfolio analysis matrix presented by Monczka et al. (2009, p. 216, 404) is a model easily adapted to the Chilean Navy to classify the suppliers, services, and goods into different categories to set the proper strategy for each family of purchase. The classification is running on the basis of the complexity of the acquisition and the value of the goods or services within the organization. In case of the Chilean Navy, the complexity could be set based on the number of suppliers in the market of the required goods, and the value could be set on the basis of the impact that this element or service triggers in the development of the end-user's operations.

A similar model is suggested for use in the organization of the U.S. Department of Defense in *DOD Supply Chain Management. Guide to Implementation* (LMI, 2000, p. 81); however, this time the classification is established in accordance with the relationship of purchase risks and their economic impact. A combination of both models

is shown in Figure 3, and its implementation is suggested for the construction of the Chilean Navy supply chain strategy.

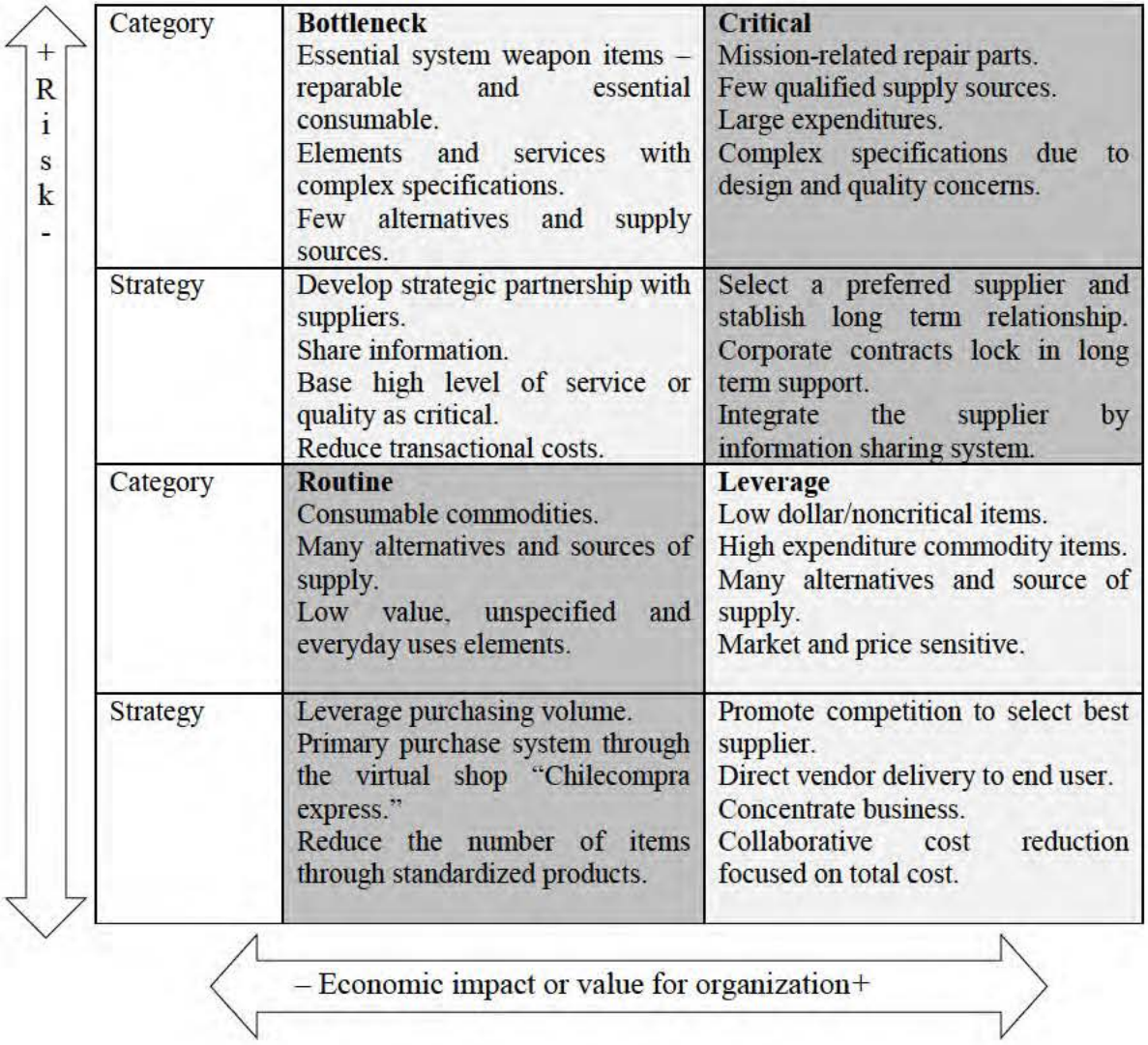

Figure 3. Strategy portfolio matrix

The sourcing strategy has to be supplemented with inventory policies for each purchase category. Inventory policbcies are established based on the associate risks, the impact in the operations, order-cycle time, and the rotation of the items. A coherency is required between the inventory rules, the acquisition strategy, and the end-user's operation requirements.

2. Recommendation 7

The Director of Logistics sets regulations to establish a strategic approach to the acquisition of certain families—Critical, Bottleneck, Routine, and Leverage items—whose characteristics define the sourcing strategy that determines the level of integration with suppliers and procedures of acquisition that have to be coherent with the inventory polices.

E. CHANGE IMPLEMENTATION

The resistance to change is one consideration to take into account prior to the implementation of new procedures and adjustments inside any organization. A proper implementation of the stated recommendation requires that the Chilean Navy logistical organization understand what the causes of that resistance are, and how to mitigate it using tactics of organizational development. All changes in an organization of the Chilean Navy's size presents some difficulties and characteristics that have to be considered, including the implementation of an organizational culture, resistance to change, and behavior of the people. One of the most important considerations is about resistance to change shown by employees, even when data and successful examples suggest the necessity of that change. The resistance to change rises from individual sources as habits, security, and fear of the unknown. In addition, organizational sources as structural inertia, threat to expertise, and threat to established powers, all apply to the Chilean Navy logistics organization. In *Essentials of Organizational Behavior* (2012, p. 237), Stephen Robbins and Timothy Judge include tactics to help during the implementation of change in an organization that resists change.

- Education and communication: to transmit the logic behind the change to reduce the effect of misinformation and promote the necessity of the change.
- Participation: Change is difficult to resist when it results from broad participation.
- Building support and commitment: Providing employees with the support required in the process.

- Develop positive relationship: Trust is a fundamental element in the implementation process.
- Implementing changes fairly: The implementation process is facilitated when employees understand the motivation for the change and the process is conducted fairly.

The John Kotter Eight Step Plan (Robbins & Judge, 2012, p. 239) for implementing change provided managers with a guide to facilitate the process of change implementation that can be used by the Chilean Navy to overcome the resistance to change.

1. Establish a sense of urgency
2. Empower people to lead the change
3. Create a new vision to direct the change and the strategy to reach it
4. Communicate the vision
5. Empower other to remove barriers
6. Plan for, create, and reward short-term victories aligned with vision
7. Consolidate improvement making changes in the current procedures
8. Reinforce the change trough examples of success

1. Recommendation 8

The implementation team has to work with the current personnel in charge of the procurement process to develop implementation strategies such as internal culture, gaining their confidence and building support; and transforming them into agents of change in the implementation. John Kotter's Eight Step Plan is a powerful tool that could be applied to this case.

V. CONCLUSION AND AREAS FOR FURTHER RESEARCH

A. CONCLUSION

The supply management analysis of the Chilean Navy acquisition system has been performed using their structure, regulation, and procedures with the founding principles of supply management established as a theoretical framework. Eight recommendations were formulated that once implemented, could improve the Chilean Navy logistics organization and its procurement process. In addition, the difficulties of the system were explained with respect to implementing a long-term relationship with suppliers using regulations that emphasize the principles of transparency and equality of offers.

The Chilean Navy Acquisition organization is led by the Director of Logistics with the mission of providing the material and technological resources to the Navy; the developments of their actions have an impact on the Chilean Navy operations and mission accomplishment. The organization is constituted by Directorates, Missions and Services in charge of support of the materials, and performs acquisition processes associated with their sphere of competence of common systems. The effectiveness and efficiency in their actions will ensure the operational capacity of the fighting forces. The adoption of supply management concepts through the implementation of the foundational principles will contribute to cost savings and increased efficiency. These foundational concepts include strategic formulation, performance measurement, supply base optimization, management, and adequate organizational structure.

The Chilean Navy logistics organization corresponds to a center-led type organization based on its structure and the location of purchase authority, but fails setting the authority based on price ceiling and not having proper purchase regulations that require the intervention of more than one Directorate. The selection of organizational structure and the location of purchase authority impact the response time and adaptation capability to change in the environment. In the Chilean Navy scenario, it is suggested the implementation of cross-organizational teams to accomplish integration into the supply

chain and to execute procurement process in acquisition that involve to more than one Directorate or Service.

The recommendations were developed using the current regulations that set the Chilean Navy acquisition system according to effective national laws and other regulations, which jointly established the obligations and responsibility of different entities inside the procurement processes and the procedure to the execution. In general, those regulations state that any purchase or contracting of services shall be performed under a full and open competition system based on strict requirements and evaluation of offers. The laws and norms prior detailed are founded in principles that have to be considered to all Chilean government entities, namely: Economic criteria, equality of offers, publicity, and transparency, contractor suitability, strict subordination to the solicitation document, and administrative probity.

Current Chilean Navy procurement regulations do not specify the evaluation criteria for suppliers, allowing different entities to set the requirements needed for the selection of providers. The performance measurement of all supply chains improves the decision-making process to sustain it based on objective data, and it helps to communicate goals, and detect and control deficiencies in the supply chain. The Chilean Navy acquires from different providers the elements and services necessary to complete its mission. The efficiency in the development of its procurement activities and the suppliers' performances condition the Chilean Navy capacity to reach its goals; for which reason, the proper supply evaluation criterion permits the mitigation of those risks. Supply base optimization and its management allow an increase in the efficiency of the productive process once the supplies are obtained in a timely manner and at an appropriate quantity and quality from the best providers. Here the suggestion is focused on including supplier selection criteria to determine supplier competence, and incorporate the evaluation of the vendor's performance.

The Chilean Navy does not evaluate the performance of a complete supply chain, making it difficult to detect bottlenecks and deficiencies. Currently, it uses the availability of their units as a principal tool to measure the supply chain performance, and preventing them from determining the effectiveness of the adopted measurements and

opportunities of progress. ERP systems currently collect enough data to implement a performance evaluation process that includes perfect order fulfillment, supply chain response time, and weapon system mission capable rates. To supply base management, it is necessary that the provider selection and performance evaluation reduce cost and risk, and increase the value for customers. It should be required that the Navy obtains and preserves that information for proper administration of the supplier base, its rationalization, and optimization. The recommendation is to implement a supply chain performance measurement process based on the supply chain response time and perfect order fulfillment.

The supply chain strategy has to be structured based on data of the products and services required by the organization provided by spend analysis, and their classification performed through portfolio analysis. The strategic plan aligns the organization to reach a common goal and establishes the way to coordinate those activities between its members to obtain a competitive advantage. The supply chain strategy formulation is required to be consistent with Chilean Navy operation and development strategy and based on historical data during a period. Once the information on the expenditure, product, services and suppliers is consolidated, it is possible to initiate the process of sourcing strategy formulation through the model of portfolio analysis, in which the products and their suppliers are classified according to the complexity of the acquisition and the value generated for the user in four different purchase categories: Bottleneck, Critical, Routine, and Leverage; and a particular acquisition strategy is set to each purchase category. The sourcing strategies have to be supplemented with inventory policies for each purchase category. The recommendation here is to formulate the supply strategy based on data coming from spend and portfolio analysis, and supplement it with inventory polices

To adopt a supply chain strategy, the organization's resistance to change has to be considered earlier in the implementation of the recommended adjustments within the Chilean Navy logistical structure. The action and planning have to incorporate tactics to help in the change implementation, and the John Kotter Eight Step Plan for implementing change is presented as a model to facilitate it.

Supply management is source of competitive advantage in reducing costs, providing service excellence, and reducing lead and product development time. To reach those benefits, supply chain management regulates the activities timing, resources flow inside chain, and joint planning, which has been facilitated by the development of information technology. Competitive advantage is the result of resources allocation and the way a company performs its activities it is expressed by gaining higher profits than the competitors. How companies manage the relationship inside the supply chain, and the coordination of its activities, affects their cost and effectiveness. Through the implementation of supply chain management theory and its foundation, military organizations can obtain a competitive advantage that is shown as obtaining and maintaining national defense capabilities more efficiently and at a lower cost.

B. AREAS FOR FURTHER RESEARCH

As was stated during this research, the inventory polices are a vital supplement to the adoption of supply management principles. The efficiency provided by supply management needs to be complemented with inventory polices consistent with the indicated procurement strategy for various purchase categories. The inventory policies duly formulated are important elements that allow savings in resources and improvement in the response of the logistics system to end users' needs.

Management efforts should emphasize the contribution of formulating inventory polices, which consider the elements that determine the selection of inventory methods such as the nature of each purchase category, the resources available for these type of products, their rotation, and procurement lead time. Proper inventory polices reduce costs, avoid disruption and increase operational performance, take advantage of order quantity discounts, and reduce market uncertainty (Monczka et al., 2009).

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